APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,894	11/23/2001	Bahram Javidi	UCT-003	7643

23413 7590 04/17/2007	EXAMINER
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002	DINH, MINH

	ART UNIT	PAPER NUMBER
	2132	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	09/993,894	JAVIDI ET AL.
	Examiner	Art Unit	
	Minh Dinh	2132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *26 January 2007*.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-16,26-28 and 31-35* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-16,26-28 and 31-35* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *23 November 2001* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some *   c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This action is in response to the amendment filed 1/26/07. Claims 1, 26 and 31 have been amended; claims 29-30 have been cancelled.

Response to Arguments

2.   Applicant's arguments filed 1/26/07 with respect to the rejections of claims 31-35 under 35 USC 112, first and second paragraphs have been fully considered but they are not persuasive. Applicant notes that independent claims 1, 26 and 31 have been amended to overcome the rejections (page 8, section I); however, only claims 1 and 26 have been amended (i.e., by removing the thresholding step). Therefore, claims 31-35 are still subject to the rejections.

3.   Applicant's arguments filed 1/26/07 have been fully considered but they are not persuasive. Applicant argues that Marom ("Analysis of Spatial-Temporal Converters for All-Optical Communication Links") teaches adding a temporal factor $K_n(t)$ to overcome temporal overlap of pulse, and therefore, the sampling in Marom is in the temporal domain and not in the spatial domain as claimed (page 9). Marom discloses that sampling is done in the temporal domain at the transmitting end based on a temporal separation of

Δ''/c (equation 13, page 2861, left column; equation 14, page 2861, right

column) so that the temporal factor $K_n(t)$, which includes Δ''/c, can be added

at the receiving end to overcome temporal overlap of pulse (page 2863, left

column, last paragraph – right column, 1st paragraph). Marom further

discloses that sampling is also done in the spatial domain at the transmitting

end based on a value Δ being the spatial separation between adjacent point

sources in a data array (page 2860, left column, last paragraph) wherein Δ

is used to derive Δ'' (equation 11, page 2861, left column), which is later

used in sampling data in the temporal domain. Therefore, data sampling in

the spatial domain also determines the value of the temporal factor $K_n(t)$,

which is used to overcome temporal overlap of pulses. Accordingly, solving

the overlap of data in the temporal domain would solve the overlap of data

in the spatial domain.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner
> and process of making and using it, in such full, clear, concise, and exact terms as to
> enable any person skilled in the art to which it pertains, or with which it is most nearly
> connected, to make and use the same and shall set forth the best mode contemplated by
> the inventor of carrying out his invention.

5.   Claims 31-35 are rejected under 35 U.S.C. 112, first paragraph, as

failing to comply with the enablement requirement. The claim(s) contains

subject matter which was not described in the specification in such a way as

to enable one skilled in the art to which it pertains, or with which it is most

nearly connected, to make and/or use the invention. Claim 31 recites the

limitation "thresholding the resulting decrypted, reconstructed information to

recover data lost due to sampling the encrypted data". The specification

discloses that redundant data, which is original digital input data prior to

encryption, was needed in thresholding of the reconstructed data to recover

data lost due to sampling the encrypted data (page 18, lines 15-20). In

light of the specification, the amended feature raises two issues. First, the

specification does not disclose how the receiving entity has access to the

original, unencrypted input data in order to perform the thresholding (When

was the original, unencrypted input data transmitted to the receiving entity?

Was it transmitted in plaintext or in encrypted format?) Thus, the disclosure

fails to enable one skilled in the art to make and use the claimed invention.

Claims that are not specifically addressed are rejected by virtue of their

dependency.

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and
distinctly claiming the subject matter which the applicant regards as his invention.

7.   Claims 31-35 are rejected under 35 U.S.C. 112, second paragraph, as

being incomplete for omitting essential elements, such omission amounting

to a gap between the elements. See MPEP § 2172.01. Regarding claim 31,

the omitted element is: the redundant data, which is original digital input

data prior to encryption, was needed in thresholding of the reconstructed

data to recover data lost due to sampling the encrypted data (page 18, lines

15-20). Claims that are not specifically addressed are rejected by virtue of

their dependency.

8.   Claims 31-35 are rejected under 35 U.S.C. 112, second paragraph, as

being incomplete for omitting essential steps, such omission amounting to a

gap between the steps. See MPEP § 2172.01. Regarding claim 31, the

omitted steps are: transmitting and receiving redundant data, which is

original digital input data prior to encryption. Without these step, the

receiving entity would not have the original digital input data for

thresholding of the reconstructed data to recover data lost due to sampling

the encrypted data (page 18, lines 15-20). Claims that are not specifically

addressed are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis

for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or
> described as set forth in section 102 of this title, if the differences between the subject
> matter sought to be patented and the prior art are such that the subject matter as a
> whole would have been obvious at the time the invention was made to a person having

ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 1-16, 26-28 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Javidi et al (5,903,648) in view of Marom et al. ("Analysis of Spatial-Temporal Converters for All-Optical Communication Links").

Regarding claim 1, which is exemplary of claims 26 and 31, Javidi discloses a method for encrypting optical images. Javidi further discloses that an image is optically encrypted, and that the resulting encrypted data is stored and read out in the spatial domain (Abstract; col. 3, lines 16-60; fig. 7). Javidi also discloses transmitting the encrypted data in the spatial domain, receiving and decrypting the encrypted data to recover the image (fig. 16).

Javidi disclose transmitting the data in the spatial domain. Javidi does not disclose converting the data from the spatial domain to the temporal domain prior to transmission and converting the converted data to the spatial domain at reception. Marom discloses an optical communication method in which data is converted from the spatial domain to the temporal domain prior to transmission, transmitted and converted from the temporal domain to the spatial domain at reception (Abstract; figures 1-2; Section 2, pages 2859-2863). Marom discloses that sampling is done in the temporal domain at the transmitting end based on a temporal separation of Δ''/c

(equation 13, page 2861, left column; equation 14, page 2861, right column) so that the temporal factor $K_n(t)$, which includes Δ''/c, can be added at the receiving end to overcome loss of data due to temporal overlap of pulse (page 2863, left column, last paragraph – right column, 1st paragraph). Marom further discloses that sampling is also done in the spatial domain at the transmitting end based on a value Δ being the spatial separation between adjacent point sources in a data array (page 2860, left column, last paragraph) wherein Δ is used to derive Δ'' (equation 11, page 2861, left column), which is later used in sampling data in the temporal domain. Therefore, data sampling in the spatial domain also determines the value of the temporal factor $K_n(t)$, which is used to overcome temporal overlap of pulses. Accordingly, solving the overlap of data in the temporal domain would solve the overlap of data in the spatial domain. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Marom method of communication into the Javidi method of transmitting encrypted data such that the data is converted from the spatial domain to the temporal domain prior to transmission, transmitted and converted from the temporal domain to the spatial domain at reception. The motivation for doing so would have been to increase the bandwidth of a fiber-optic communication link.

Regarding claims 2, 6, 27 and 32, Marom further discloses conversion

of ultrashort light pulses which meet the limitation of ultrafast laser pulses

(Abstract; fig. 1, page 2858, left column).

Regarding claims 3-4, 33 and 35, Marom further discloses conversion

of ultrashort pulses spread in the spatial domain using diffraction and

according to their spectral components (fig. 1; page 2860, left column, last

paragraph).

Regarding claim 5, Marom further discloses an optical network for

transmitting the converted data (Title; Abstract).

Regarding claims 7-8 and 28, Javidi further discloses that the optical

encryption includes double random phase encryption (Abstract).

Regarding claim 9, Javidi further discloses that the double random

phase encryption includes phase encryption in the spatial domain and phase

encryption in the frequency domain (col. 3, lines 16-38).

Regarding claim 10, Javidi further discloses storing of encrypted data

comprises holographically storing said encrypted data (fig. 3).

Regarding claims 11, 13 and 34, Marom further discloses forming a

real-time hologram using read-out data and a reference beam, reading out

the real-time hologram, and converting the read-out hologram from the

spatial domain to the temporal domain (fig. 1; page 2860, left column, last

paragraph).

Regarding claims 12, 14, Marom further discloses that reading out the real-time hologram comprises directing a diffracted ultrashort pulse at the real time hologram (fig. 1; page 2860, left column, last paragraph).

Regarding claims 15-16, Javidi further discloses that decryption includes phase decoding in the spatial domain and in the frequency domain (col. 3, lines 39-60).

Conclusion

11.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications

from the examiner should be directed to Minh Dinh whose telephone number

is 571-272-3802. The examiner can normally be reached on Mon-Fri:

10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Gilberto Barron can be reached on 571-272-3799.

The fax phone number for the organization where this application or

proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained

from the Patent Application Information Retrieval (PAIR) system. Status

information for published applications may be obtained from either Private

PAIR or Public PAIR. Status information for unpublished applications is

available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on

access to the Private PAIR system, contact the Electronic Business Center

(EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated

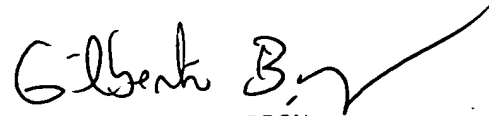information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-

1000.

MD

Minh Dinh
Examiner
Art Unit 2132

4/13/07

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